ATTACHMENT 4: PROJECT DESCRIPTION

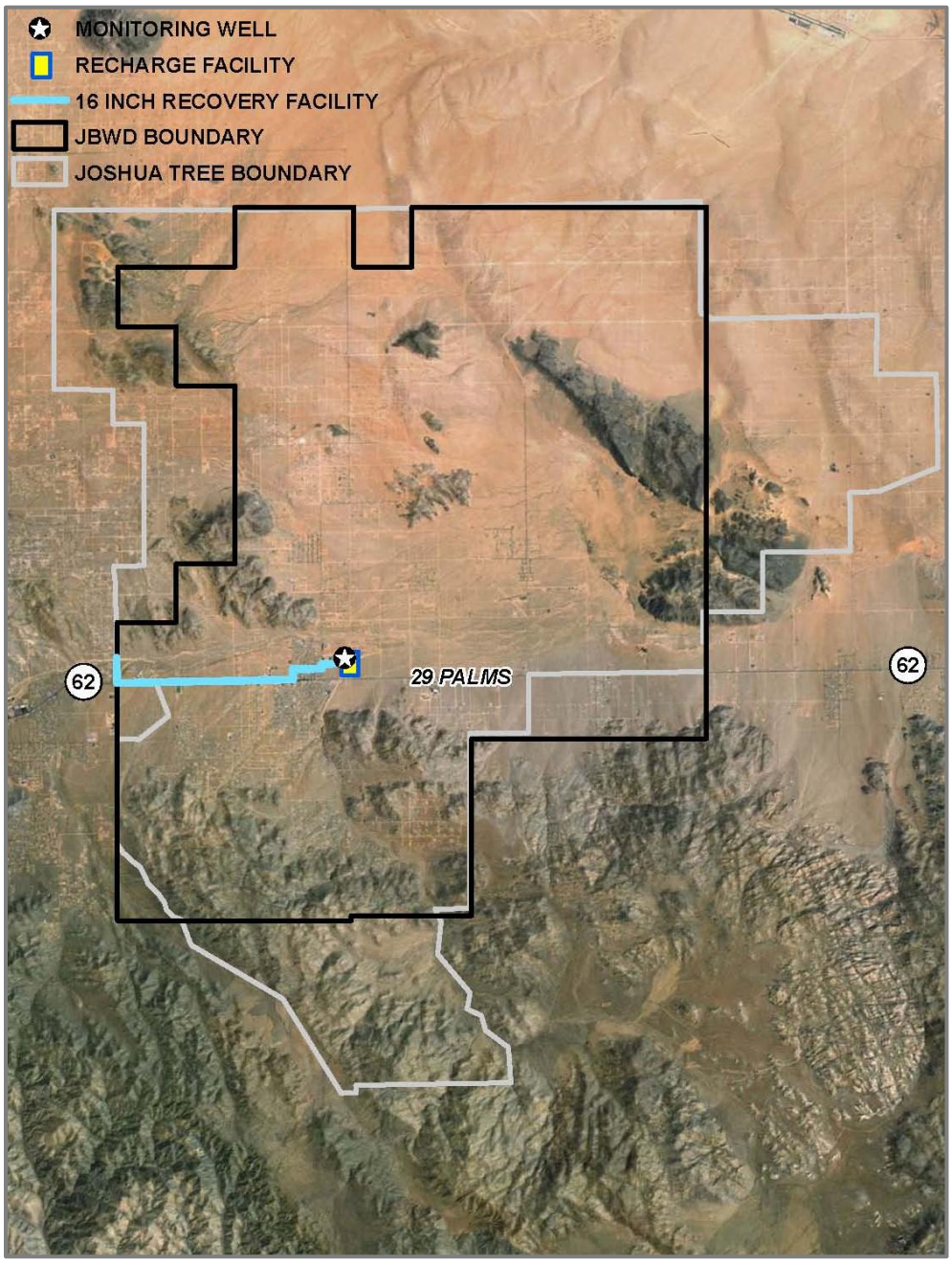
The following project description for Joshua Basin Water District's Water Recharge Monitoring Well Project includes: need for the project, goals of the project, location and area covered, as well as, referenced exhibits.

(1) Provide a complete, detailed description of the proposed project, including the goals of the proposal, needed facilities, their location and the area affected.

The Joshua Basin Water District (JBWD) is seeking LGA grant monies to construct the District's ***Water Recharge Monitoring Well Project*** (see Figure 1 on the following page). The District's ***Water Recharge Monitoring Well Project*** is for the design and construction of an approximately 1,000-foot deep monitoring well with 3-5 piezometers and other instrumentation (See Figure 1). The monitoring well is needed to: 1) track the movement of recharge water within the Joshua Tree groundwater basin to optimize pumping and ameliorate overdraft conditions; 2) monitor groundwater recharge impact on nitrate concentrations; and 3) expand the region's overall understanding of water recharge and movement for optimized groundwater management. The ***Water Recharge Monitoring Well Project*** directly synergizes the District's Water Recharge Facility Project (partially funded with Prop 84 IRWM funds) and is recommended by the USGS. The basic concern is that rising water levels resulting from AR entraining nitrates (anthropogenic occurrence from septic tank effluent) stored in the unsaturated zone. The source of the nitrates is septic-tank effluent. The USGS has already installed an unsaturated-zone monitoring site at the proposed recharge site. The ***Water Recharge Monitoring Well Project*** will allow USGS and the District to monitor the flow of water to the water table and to monitor any water-quality changes. In addition to UZ instrumentation USGS installed one well at the water table which will allow then to monitor water levels and water quality on site.

The ***Water Recharge Monitoring Well*** will be located down-gradient from the water recharge site and will be approximately 1,000-feet deep with a minimum of three and up to five piezometers with pressure transducers installed in each. In addition to depth-dependent water levels, depth-dependent water-quality data will also be collected. The idea is that the monitoring well will be an early warning system to help prevent a high-nitrate event from occurring in JT. The transducers record water-level data at 1-4 hour intervals and these data are downloaded every 6-8 weeks. USGA will also collect water-quality data (stable isotopes, nutrients, DOC, major and minor ions) from each piezometer. Prior to recharge starts which will occur upon completion of the Water Recharge Facility project, USGA will collect data 2-3 times and once the recharge begins, USGS will collect data quarterly. The water-level and water-quality data from the new site will be in addition to data collected from the existing well at the recharge site (JTUZ-4). The location of the monitoring well will provide the District and USGS with the best opportunity to monitor movement of the recharged water within the groundwater basin and verify the timing of recharged water to the target production aquifers. Although the benefits of the monitoring well have not been monetized, they are important to the region's understanding of water recharge and movement and its impact on nitrate concentrations.

Figure 1


MONITORING WELL
RECHARGE FACILITY
16 INCH RECOVERY FACILITY
JBWD BOUNDARY
JOSHUA TREE BOUNDARY
62
29 PALMS
62

(2) Demonstration of the long-term need for and merit of the proposed project.

It is imperative that JBWD's provide for the long-term sustainability of the Joshua Tree and Copper Mountain Groundwater Basins as well as the surrounding vicinity, particularly given that this area has extremely low natural recharge. USGS age-dating of the water suggest the water being pumped today was recharged between 5,000 and 30,000 years ago. Overdraft in a basin can cause wells to go dry, water quality to be degraded, land to subside, and riparian habitats to be affected. These situations are deleterious to the community as well as the large ecological system. Average rainfall within the Joshua Tree area is roughly five inches per year. Inflows as much as 157 acre-feet per year via runoff from local washes has been estimated by USGS modelers, but there is great uncertainty how much of this water reaches the water table. Hence, ***Water Recharge Monitoring Well Project*** is of paramount importance and value to the District and the larger region. With the implementation of the project, both the USGS and the District will be able to determine how and where the water is migrating so as to provide a better understanding of the problem and a keener ability to ameliorate the situation through more targeted and effective management and potentially, other projects. The information and data gathered through the well will allow the District to make more informed and better decisions about judicious groundwater use and management.

Geographically, JBWD is situated in the Mojave Basin, a desert separated from the temperate coastal climate of the Los Angeles Basin by the San Gabriel and San Bernardino mountains approximately 10,000 feet in elevation above mean sea level. Within the Mojave Basin, JBWD's service area extended over Copper Mountain and Joshua Tree groundwater basins. Although, JBWD overlies a significant supply of high quality groundwater, the region's arid environment limits the extent to which the groundwater supply is recharged.

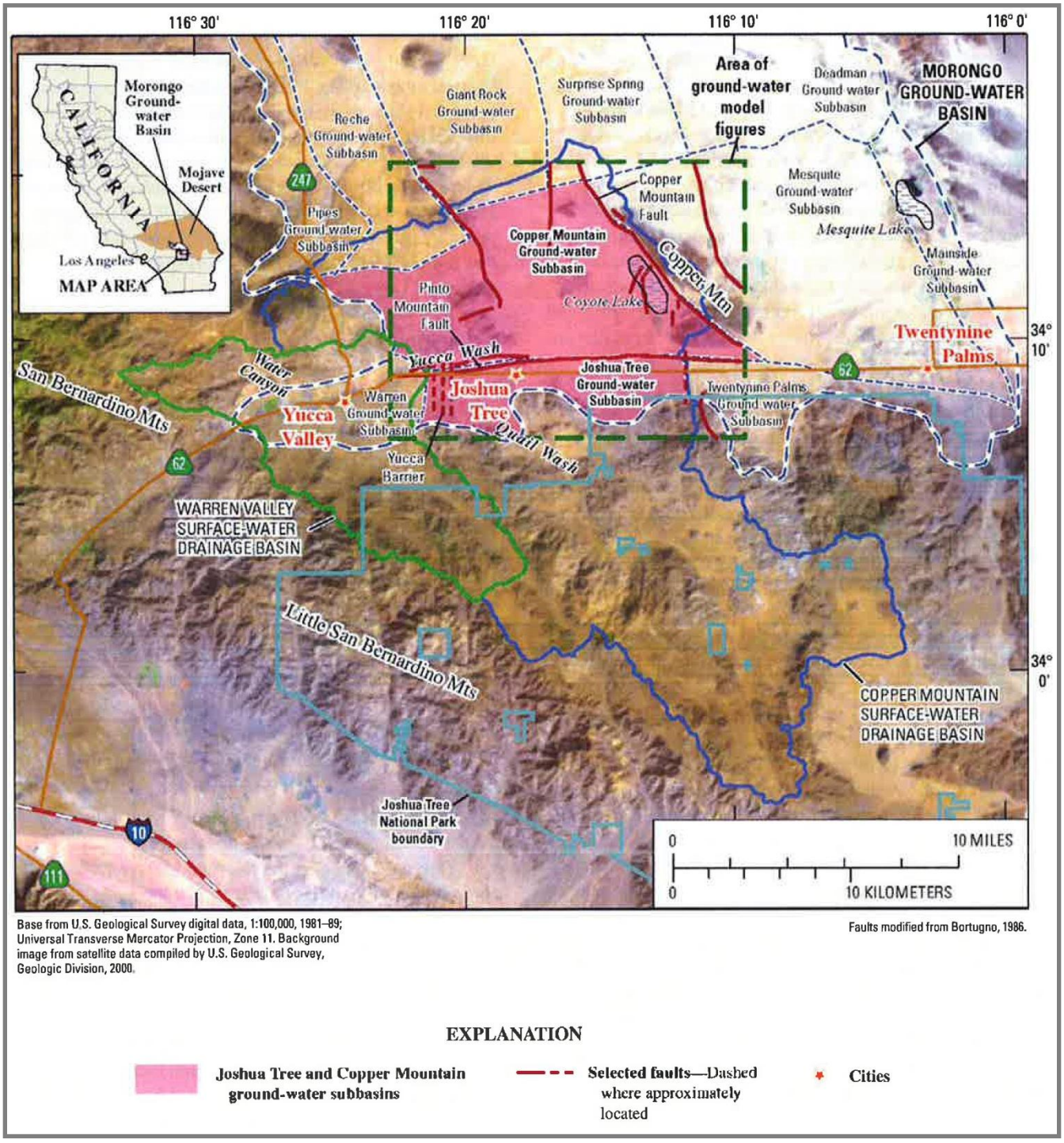
JBWD supplies water to the community of Joshua Tree from the underlying Copper Mountain and Joshua Tree groundwater basins. These groundwater basins overlie a broad hydrologic region, as defined in DWR Bulletin 118-03 as the Colorado River (Region 7) hydrologic region. These groundwater basins within the District's service area are bounded by the Ord and Granite Mountains to the north, the Bullion Mountains to the east, the San Bernardino Mountains to the southwest, and the Pinto and Little San Bernardino Mountains to the south. The groundwater basins are comprised of non-water bearing rock which forms the boundary of the Joshua and Copper Mountain basins. A graphical representation of these basins can be seen on Figure 2 below.

The Mojave River and other tributary drainage channels to the Copper Mountain and Joshua Tree groundwater basins are dry during most months of most years, and surface flow is an unreliable source of water except in infrequent intense storm periods. As a result, water users in JBWD's service area rely entirely on groundwater supply. Currently in a state of overdraft, the observed water level within these basins has been lowered by approximately 35 feet over the last 45 years. In 2004, the United

States Geological Survey (USGS) completed a study concluding that approximately 1,600 acre-feet per year (afy) is being pumped from the basins which have an in-flow of approximately 1,200 afy. This comparison of average annual supply and current levels of consumptive use within JBWD's service area shows that consumptive use exceeded average annual water supply from natural sources by 400 afy, suggesting that under current conditions.

Presently, the amount of groundwater extracted has exceeded the estimated amount recharged, leading to the overdraft condition. Groundwater modeling studies have identified that the current recharge project will halt and reverse nitrate contamination within the District's only water supply, however without the ability to monitor the migration of the groundwater, effectively measure the nitrate concentration and gain a greater insight into the functioning of the basin, the District will constantly have to be reactive instead of proactive. The ***Water Recharge Monitoring Well*** is therefore a critical element of effective groundwater management and provides the District (and USGS) with the best opportunity to monitor movement of the recharged water within the groundwater basin and verify the timing of recharged water to the target production aquifers, thus increasing sustainability of the groundwater basin and improving water quality. The District's ***Water Recharge Monitoring Well Project*** provides a critical component to the District's plans as articulated in the 1996 GWMP to manage declining groundwater quality and quantity in its Copper Mountain and Joshua Tree groundwater basins.

FIGURE 2 - JBWD GROUNDWATER BASINS



(3) Describe how the applicant demonstrates collaboration with other local public agencies with regard to the management of the affected groundwater basin, including coordination with state and federal agencies.

JBWD coordinates extensively with local, state and federal agencies for the sustainable management of the groundwater basins within its jurisdictional boundaries.

Local agencies The District is entitled to receive SWP water through cost participation with the Mojave Water Agency (MWA) Morongo Basin Pipeline Project. MWA is a SWP contractor that serves an area of 4,900 square miles of the high desert region of Southern California. In January 1995, the MWA completed construction of a 71-mile pipeline to deliver SWP water to the communities served by the Hi-Desert Water District, Bighorn-Desert View Water Agency, San Bernardino County Service Area 70, and Joshua Basin Water District. This construction project included an agreement which entitled the District to an annual volume of 1,959 afy of SWP water until 2022. Negotiations are almost complete between JBWD and MWA to extend the date and quantity of that allocation.

In addition, the JBWD secured a portion of the funding for the Water Recharge Facility Project from the Mojave Water Agency. Hence, the JBWD is collaboratively working with local agencies for sustainable management of the groundwater basins.

Federal agencies The District has a long history and ongoing relationship with the United States Geologic Survey (USGS). JBWD contracted with the USGS for evaluation of nitrate conditions and potential recharge sites prior to design of the District's Water Recharge Facility Project. USGS, as part of its contract, constructed two unsaturated zone wells on the proposed recharge site. During further consultation with the USGS on the District's Water Recharge Facility project, the USGS also identified the need to construct a deeper saturated zone monitoring well for the purpose of monitoring groundwater levels and for testing water quality (particularly nitrate concentration) impacts; this is the project that is being proposed by JBWD for funding through LGA funds.

The District maintains a very close, productive and on-going relationship with USGS and is working hand in hand with them to address issues toward effective groundwater management and long-term sustainability of the Joshua Basin and Copper Mountain Groundwater Basins.

(4) An explanation of how the ongoing use of the product(s) of the proposed project, including any required ongoing monitoring or maintenance, once grant funding is expended, will be funded.

The grant funding will provide for the design and construction of the needed monitoring well. Once built, the District will operate and maintain the well using General Revenue District funds. USGS will do all the monitoring and share the results with JBWD.

(5) Describe measures that will be used to evaluate data and mechanisms to adapt the new knowledge obtained in the improvement in groundwater management consistent with the goals and objectives of the GWMP or other groundwater management program.

The monitoring well includes the installation of install 3-5 piezometers with pressure transducer installed in each. The transducers record water-level data at 1-4 hour intervals and these data are downloaded every 6-8 weeks. USGS will also collect water-quality data (stable isotopes, nutrients, DOC, major and minor ions) from each piezometer. Prior to the recharge starts from the Water Recharge Facility Project, USGS will collect data 2-3 times. Once the Water Recharge Facility Project is online, USGS will collect data quarterly. The water-level and water-quality data from the monitoring site will be used in addition to data collected from the existing well at the recharge site (JTUZ-4) to present a more accurate picture of the health of the groundwater basin.

It is fundamental objective of JBWD is to manage declining groundwater quality and quantity in its Copper Mountain and Joshua Tree groundwater basins. In accordance with the objectives adopted from 1996 JBWD Groundwater Management Plan (GWMP), JBWD is obligated to manage the local groundwater basins. The purpose of the GWMP is to enable JBWD to manage its groundwater quality and supply in a manner that avoids groundwater contamination or excessive overdraft, while simultaneously continuing to provide the present and future residents of its service area with a safe and reliable water supply.

The data and information gathered through the monitoring well project has a direct impact on the ability JBWD has to meet the purpose of its GWMP. The well provides a window into the elusive world or groundwater migration in the Joshua Tree and Copper Mountain Basins. With the implementation of the project, the USGS and the District will have a deeper understanding and more accurate picture of how and where the recharge water is moving, its impacts on nitrate condition and other water quality impacts and allow these entities to best strategize for a sustainable groundwater basin condition. The information will be readily absorbed and used to either adapt to a situation or generate more effective groundwater management strategies and potential projects. The ability to incorporate the monitoring well data and information for District planning and better decision making is priceless.

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